

DO'S AND DON'Ts FOR CAMPERS

A visit to a wildlife sanctuary or a National Park can be a very special experience, because it is an opportunity to see and understand the natural phenomena that keep the world alive. The vegetation, animals, birds, insects, and the interaction between them are really the mechanics of a living world. And we, as a part of creation, are a part of the process. So let us use this visit to understand, also, our part in this world we live in.

REMEMBER :-

1. Try and keep outside influence, as far as possible, outside the sanctuary. Transistors, tape recorders and loud conversation are taboo in a sanctuary. You'll observe more of wildlife if you proceed quietly.
2. Dress in colours that blend with the forest. Khaki, brown, and olive green are ideal colours to wear in a sanctuary.
3. It is necessary to guard against and avoid any form of pollution within the sanctuary or national park areas either of the air, the soil, or the water, including damages to the flora and fauna.
4. In a sanctuary or national park, don't expect to see all the 'big game' animals. Skill has its place but luck is just as important. Rather than being disappointed at not seeing a tiger, leopard or other big jungle rarity, you can happily observe all the smaller interesting creatures and plants.
5. Don't go near a nest, because it disturbs the birds. When a bird is alarmed, it can damage the eggs that are being hatched. You are a guest in a sanctuary. Treat your hosts with respect.
6. Make full use of local guides, tribals etc. They are likely to be illiterate but that only means they have had that much more time for learning all about the jungle and the creatures and plants therein.
7. Keep a reasonable distance from all animals. Approaching too closely will disturb them.
8. If you are in a vehicle, bear in mind that wild animals have the right of way within a sanctuary or national park and don't horn.
9. Make checklists of creatures observed on a trip. Make your own simple notes which you can easily compare from trip to trip.
10. Take strict precautions to guard against accidental forest fires caused through carelessness.

A final word : The best thing you can take out of a sanctuary when you leave is a happy memory of a trip well spent. So make the most of this visit - learn a little more of the world you are a part of.

MUTHODI CAMP

- K.A. Bhoja Shetty
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LOCALITY FACTORS :

In 1951 Jagara Valley game sanctuary, with an area of 252 sq. kms. was constituted and this included Muthodi section. Subsequently, Lakkavalli forest was added to the old game sanctuary to form Bhadra Wildlife Sanctuary, with an area of 492 sq.kms. The sanctuary is situated at the foot of Bababudan hills, about 50 kms to the east of Western Ghats.

General elevation is 650 m. to 750 m. Abutting mountain ranges are 1200m to 1500m in elevation. The highest peak, Mullainagiri, is 1900m high.

Rivers flowing through the Sanctuary are Somavahini and Bhadra which join at Hebbe. Muthodi is on the bank of Somavahini.

Annual rainfall ranges from 2000 mm to 2500 mm and bulk of it is received from the south-west monsoon during June to August.

FOREST TYPES :

The main factors which determine vegetation types are :-

- a) Climate namely, temperature and rainfall.
- b) Soil
- c) Biotic, that is influence of man and domestic animals.

Classification of vegetation is generally based on climatic zones and morphological features of vegetation. However, within the same climatic zone, edaphic variants may be found. Such changes in vegetation are chiefly caused by soil variations.

TROPICAL FORESTS :

The tropical forests of India may be broadly classified into the following seven groups.

1. Wet evergreen forests - Dense, tall forest; entirely evergreen or nearly so.
2. Semi-evergreen forests - Dominants include deciduous species but evergreens predominate.
3. Moist deciduous forests - Dominants mainly deciduous but sub-dominants and lower storeys largely evergreen. Top canopy rarely dense and even but over 25m high.

4. Littoral and swamp forests - Mainly evergreen of varying density and height but always associated predominantly with wetness.
5. Dry deciduous forests - Entirely deciduous or nearly so. Top canopy rather light and rarely over 25m. high usually 8-20m.
6. Thorn forests - Deciduous with low thorny trees and Xerophytes predominantly. Canopy more or less broken. Height under 10m.
7. Dry evergreen forests - Hard leaved evergreen trees predominate with some deciduous emergents, often dense; usually 20m high.

MUTHODI FORESTS :

Forests at Muthodi are the southern tropical moist deciduous type. These contain several important timber species, namely, Tectone grandis (teak), Dalbergia latifolia (rosewood), Pterocarpus marsupium (honne), Lagerstroemia lanceolata (nandi), Terminalia tomentosa (mathi), Terminalia paniculata (hulure), Grewia tilae-folia (thadasalu), Xylia xylocarpa (jambe) and Toona ciliata. Other trees in the top canopy are Terminalia bellerica (thare), Diospyros montana (Jagala ganti), Bombax malabaricum (Silk cotton), Dillenia pentagyna, Ficus spp., Albizia odoratissima and Syzygium cumini (nerale). Trees are luxuriant in growth and attain a height of 30m to 40m.

Species commonly found in the lower storey are Cassia fistula (kakke), Dolichandrone falcata, Wrightia tinctoria (Hale), Bauhinia racemosa, Zizyphus xylopyrus, Butea monosperma, Kydia Calcina and Mallotus philippensis.

Trees forming the upper canopy are mostly leafless during the dry season while those in the lower canopy are generally evergreen, woody climbers are commonly seen festooning trees. Acacia concinna (Shekakai) a prickly climber, is common.

Three species of bamboo found in the sanctuary are Bambusa arundinacea, Dendrocalamus strictus and Oxytenanthera monostigma. Bambusa arundinacea, thorny bamboo, is found in abundance around Muthodi and attains luxuriant growth. Oxytenanthera monostigma occurs in moister locations, particularly along stream and river banks. Dendrocalamus strictus is in drier regions towards Lakkawalli.

Eupatorium odoratum and Lantana camera, both exotic species, are common weeds found in the openings in the forest. Eupatorium like Parthenium, was introduced inadvertently in India, while Lantana was brought as a garden plant for its attractive flowers.

Proceeding west towards the western Ghats the vegetation changes with increasing rainfall to tropical semi-evergreen and tropical wet-evergreen forests.

Eastwards on the outer-edges of Lakkawalli, the vegetation is the dry deciduous type.

BIRDS AND BIRD WATCHING

Best described as 'Feathered Bipeds', birds are believed to have sprung from reptilian ancestors in bygone aeons. Palentological evidence supplied chiefly by the earliest fossil of an undoubted bird, the 'ARCHAEOPTERYX', and modern research prove beyond doubt that birds have evolved from reptiles; in fact birds are sometimes referred to as 'Glorified reptiles'.

On account of their warm bloodedness coupled with the power of swift and sustained flight, birds enjoy a wider distribution than most other class of animals. The total number of existing bird species known to Science has been around 8860 of these over 1200 species of birds can be found in India, of which about 260 species are winter visitors.

In addition to the invention of the feather which is unique to birds. They have evolved a remarkable sense of sight which undoubtedly qualifies them as the 'Lords of the Air'. In a fraction of a second, the eye can change itself from a telescope to a microscope, such is the power of accommodation of a bird's eye. Many species of birds like waders (Snipes, Sandpipers etc.) have an almost 180° angle of vision, which not only enables them to sight their food but also warn them of an approaching hawk. Other birds like owls for example have large eyes placed well forward in the head, to give them the 'Depth in perception', which is essential for Owls to catch their prey. In birds the eyes are not moveable in their sockets, and thus the bird must turn its entire head to look in different directions. Of the other senses that of 'Hearing' is also well developed, while that of 'taste' is comparatively poor, the sense of smell is practically absent except in birds like the Kiwi and Turkey Vulture.

Having a body temperature of about 38-44°C which is higher than most mammals, birds are able to withstand great extremes in climate. Their rate of metabolism is greater than that of mammals, but they lack sweat glands, to avoid over heating and death birds have evolved a peculiar feature known as the 'air-sac's to eliminate extra-heat as soon as it is produced.

With their amazing power of adaption birds have evolved an infinite variety of beaks. From the exquisitely designed beak of a Flamingo which filters microscopic plankton to the long slender probing bill of 'Hummingbird', each suited for its own specialized diet.

From the reptiles birds inherited and retained the characteristic of egg laying. But unlike reptiles most birds incubate their eggs with the heat of their own bodies with the rare exceptions of the Megapodes (which cover their eggs with decomposing vegetation which would provide the heat for incubation). The process of incubating can be very crucial to the life of the birds and they can be extremely vulnerable.

For the safety of themselves and of their young, birds build nests; which may range from a simple scrape in the ground as of the lapwing or nightjar to such elaborate structures as the compactly woven nest of the weaver bird. Birds nest as individual pairs or in huge colonies which may contain thousands and millions of individuals. The nest is always true to the type of species that builds it, and is primarily the outcome of instinct fined and inherited through countless generations of builders. The colour pattern of bird eggs are almost as varied as the birds themselves, or as their architecture of their nests. It cannot be denied that in the main the colouration of eggs is a protective device and in a general way bears a direct relation to the types of nest in which they are laid.

There are over 80 species of birds in World including the Indian Koel and Cuckoos which indulge in what is known as 'Nest Parasitism' or simply, 'Brood Parasitism'. Their peculiar habit of making no nests of their own but utilising those of other birds for laying in and fostering their parental responsibilities upon the dupes. The eggs of parasitic nesting birds often bear a remarkably close resemblance to those of their hosts or foster parents. To ensure the survival of the parasitic bird, its egg hatches faster than the rest of the brood enabling it to outgrow it's fellow nestings and thereby having a better chance of survival.

The subject on Birds remains incomplete if one does not mention about 'Bird Migration'. The changes of habitat periodically recurring and alternating in direction which enable the birds to secure optimal environmental conditions to maintain their activity throughout the year. Migration enables birds to inhabit two different areas at the respective seasons most favourable in each. It involves a swing from the breeding or nesting place - to a breeding or resting place or it's winter quarters. Most of the birds which migrate to India come from Central Asia and all over Europe. The longest known migratory journey is performed by the Arctic tern (about 22,000 Kms).

Birds not only return to the same general locality for breeding year after year, but often also to the identical nesting site. Young birds which have had no previous experience of either the route or the destination, often thousands of Kilometers away accomplish the journey with amazing accuracy and undue mortality. Considering the gigantic scale on which bird migration takes place in India, the scantiness of our factual knowledge on every aspect of it is deplorable. Only the broad pattern is known, and that largely from rather disconnected observational records aided by reasonable conjecture.

"It is all the manifestation of the same remarkable process of evolution that has culminated in the flying bird, raising it as if by a magic wand from the lowly cold-blooded reptile to this bundle of super abundant energy - a graceful and brought creative with a mastery of the air that Man, with all his ingenuity and cunning is never likely seriously to challenge".

- Dr. Salim Ali.

BIRD WATCHING

One of the most outstanding outdoor hobbies is birdwatching. Apart from enjoying the pleasures of nature considerable scientific knowledge about birds their behaviour, migration, breeding, nesting etc. can be acquired and little more has been done in this direction.

The questions that a beginner might put such as 'How does the bird live or behave?' 'In what way is it fitted or fitting to its habitat? How is it influenced or influencing its environment? What are the benefits of birdwatching and preserving such wonderful species of nature?'

It is only satisfying answers to questions like these that can lead us to a better understanding of the very real but strangely elusive thing called life.

A hasty inexperienced beginner may fail to locate any kind of bird activity in his locality. But a careful patient observation around him may reveal many unknown but wonderful facts to him. Depending upon the availability of food and nesting sites, he might come across a number of species of birds. For instance banyan and peepal trees when in ripe, attract many species of these colourful birds and even flowering trees like Silk cotton

or flame of the forest when in full bloom provides wonderful opportunities for birdwatching.

Another favourable occasion is after the first few showers of rain and the winged termites are emerging for emerging for their nuptial flight. A termite swarm acts like a magnet upon the bird population of its neighbourhood, every species hastens to the repast and the insects being chased, captured on the ground as well as in the air.

Any waterbody considerably rich is a veritable paradise for the bird watcher in winter as swarms of migrating ducks, geese and many other species adorn the surrounding area.

Nesting birds provide much important material for the study of Bird Behaviour, they can be easily studied by building a 'hide or blind' to which the birds soon get accustomed and can be watched in comparative comfort at close quarters.

Careful experiments suggest however, that in all the seemingly intelligent and purposeful actions of nesting birds, in the solicitude. They display for the welfare of their young and in the tactics they employ when the latter is in danger, instinct and not intelligence is the primary operating factor. The power of reasoning and the ability to meet, new situations and overcome obstacles beyond the simplest, are non-existent. It is good, therefore, always to bear in mind when studying birds, and to remember that their actions and behaviour cannot be judged purely by comparison with human standards and emotion.

FIELD NOTES:

A bird watcher should keep a regular field diary to make immediate, on the spot notes of his observations, they are conveniently made in a pocket size diary and should contain the following "Field Identification Mark".

1. Date, time, place and location and climate and season.
2. Their habitat such as waterbodies, scrubland, etc.
3. Activity: Their movements, flight pattern, perching habits, Feeding habits.

4. Its shape and size as compared to the common ones like sparrow, myna, pigeon, crow, kite etc.
5. Salient features such as colour of various parts, shape of beak and legs in adaptation to the type of food it feeds on etc.
6. Call the bird makes. Try to make a catchy phrase "Did you do it?", "Brainfever", "Line clear" etc.

Equipment needed for bird watching:

A pair of good binoculars of prismatic type bearing numbers 7x35, 7x50, 6x30, 8x40, 10x50 are recommended where the first number gives the magnification and the second is the diameter of the objective, will add on the pleasures of birdwatching.

Following field guides will help you to indentify the species:

1. Book of Indian Birds by Dr.Salim Ali by Bombay Natural History Society (BNHS). Price: Rs.75/-
2. Collin's Handguide to the Birds of the Indian Subcontinent by Martin Woodcock by COLLINS, England. Price: Rs.65/-
3. Pictorial Guide to the Birds of the Indian subcontinent by Dr. Salim Ali and Dr. S.Dillon Ripley by BNHS. Price: Rs. 155/-

Dress yourself in a camouflaging dress or drap coloured dress to blend yourself to the surrounding while watching birds. The best time to watch the birds is early mornings and late evenings.

CONCEPT:

The history of environmental education goes back to the earlier parts of this Century when a movement called "Natural History Study Movement" started in Western Countries. The interest of the people in this movement was taxonomic only.

In 1940's, this movement changed into "Conservation Education Movement", because by this time, conservation of natural resources was seriously required. Nature reserves all over the world were established after this movement - legislations were passed for conservation.

Disordered development however, continued. The resources were exploited to such an extent that by 1970's, the entire environment faced a threat. Consequently, Conservation Education Movement got changed into a new movement called "Environmental Education Movement". The approach behind this movement is to make people aware of the impact of man's activities on nature - to make them realize the inter-relation and inter-dependency between man and nature - and to produce knowledgeable, motivated and action-oriented people.

WHY ENVIRONMENTAL EDUCATION :

- a) Because of a contradiction between nature's resources and society's increased requirements, and
- b) because of the need of converting deteriorating environment into optimum conditions.

In developing countries, 2 sources lead to environmental degradation ;

- 1) Wrong priorities in national investment, and
- 2) the developmental projects that affect the physical environment, and in turn everybody.

Till sometime back natural resources were abundant... human requirements were few... no contradiction -- These were the days of utilization.

At one time, non-renewable resources became alarmingly depleted and the replenishment and supply of renewable resources also became threatened -- these were the times of serious attempts at conservation. The document of World Conservation Strategy, Global 2000 Report etc. show statistics which indicate alarming rates of environmental degradation. The floods, droughts, disturbed rainfall patterns indicate that we have crossed the state of mere conservation.

We have now reached a stage where the concern is to replenish depleted resources and revert the environment back to its healthy

state. Conservation of whatever is left in nature is not a satisfactory attempt. Such tasks cannot be completed by the Governments alone but rather require the participation of the public at large.

In this context, Environmental Education has become need of the hour.

SPREADING ENVIRONMENTAL EDUCATION TO THE MASSES :

Environmental education is no doubt necessary for everyone, but to begin with, certain major targets can be selected. This should be done on the basis of priorities in environmental problems.

The problems of environmental degradation are different in our country compared with Western countries. Our basic problems are the river valley projects, the river systems, land use plans, excess cattle, deforestation, etc.

For such problems, 3 major targets to be selected first are :

- a) The planners of river valley projects. The statistics show that when seen in terms of cost/benefit ratios, the hydel power and irrigation dams in India, today, are showing more cost than the benefits...because...such dams were constructed without assessing their impact on environment.
- b) the second target should be the students of younger generation.
- c) the most important target is the village farmer. Because of extensive rather than intensive cultivation, the encroachment into marginal lands has been a major factor responsible for decimation of wildlife...the practice of raising traditional crops in marginal lands which could be used more profitably for growing quick growing tree species, is not only harmful for the farmer himself but also for the nation as such. A new land use plan cannot be forced on the farmers through legislations. It must rather reach the farmer through extensive education programmes. Environmental education, in this context, has a very important role to play.

The policy of environmental education is not to stop economic development, but rather to find out optimums in which the factor of contradiction between man and nature is minimised.

WILDLIFE ECOLOGY AND DISTRIBUTION IN INDIA

- Mewa Singh.

BASED ON SAHARIA

The distribution and abundance of wildlife ultimately depends upon the ecological conditions, including vegetation, temperature, rainfall and physical terrain.

Broadly speaking the wildlife zones in India can be divided into 3 major regions :

1. The Himalayan Mountain System;
2. The Peninsular India;
3. The Tropical Evergreen Forests.

1. THE HIMALAYAN MOUNTAIN SYSTEM : Since the altitude, rainfall and vegetation vary considerably in various parts of Himalayas, this mountain system is further divided into three sub-regions:

i) FOOTHILLS OF HIMALAYAS : Characterized by bhabar (thick boulder deposits), terai (deposits of fine silt) and Siwalik Hill ranges. Predominant tree species is Sal. Since the terai area is full of grassy meadows and savannah vegetation, the mammals found are elephant, sambar, swamp deer, chital, hog deer, barking deer, pig, tiger, panther, wild dogs and one-horned rhinoceros. The wild buffalo, brow antlered deer and golden langur are the special animals of the area. The gangetic gharial found here is absent in whole of India. The Wildlife, however, is threatened by spread of agriculture.

ii) WESTERN HIMALAYAN HIGH ALTITUDE : 1500 mt. to 2500 mt. altitude here contains coniferous pine forests. The animals found are the wild ass, yak, 3 species of wild goats, 3 species of wild sheep, 2 kinds of antelopes and 2 species of endangered deer. Most of these animals develop thick coat in winter, sharp eyed and sure footed rock climbers, adapted to harsh and cold conditions. The snow leopard, wolf, fox and smaller cats are the predators found. The characteristic birds of the area are the Himalayan Pheasants.

iii) THE EASTERN HIMALAYAS : The foothills contain semi and evergreen forests; oaks, magnolias and birch replace them at the altitudes of 1525 mt. to 1830 mt; and the coniferous forests of pine, fir and juniper cover 2745 - 3660 mt. altitude ranges. The wildlife is characteristic of Indo-Chinese fauna, including red panda, hog and ferret badgers, crestless porcupines and 3 kinds of goat antelopes.

of the rare species are the Andaman pig, Dugong and some turtles. Out of the 240 species and sub-species of birds recorded, 112 happen to be resident endemic species.

ii) BHARATPUR BIRD SANCTUARY : The 2900 hectares fresh water swamp of Keoladeo Ghana is a habitat of rich micro and macro living forms. Over a million migratory ducks, teals and geese visit this place each year. About 328 species of birds have been identified in this area, of which 110 are migratory species. A former bird hunting preserve of a Maharaja is now a world renowned bird sanctuary.

iii) MANGROVE FORESTS AND SWAMPS OF SUNDERBANS : The mangrove forests found in the Sunderbans delta where the rivers Ganges and Brahmaputra join and drain into Bay of Bengal. The hundreds of streams of these rivers there form narrow creeks. In addition to the other wildlife, the most known animals of the area is the Royal Bengal Tiger. The tigers here are of specific interest academically due to their totally different food habits - dependence on marine fauna - and also for the man-eating habits of some of them.

KARNATAKA :

A specific demonstration of ecological factors controlling the distribution of wildlife can be made by taking Karnataka as an example. The low-lying hills and the higher ranges of Western Ghats in Karnataka support different kinds of wild mammals and birds. The deciduous forests of Bandipur-Nagarahole complex harbour the mammalian fauna and birds typical of that of the peninsular India. The dry zones like Ranebennur, with scrub forests and low rainfall, harbour wildlife typically adapted to the dry plains or the deserts of Rajasthan.

Karnataka can also serve as a model for the study of human interference and the modification of wildlife habitats. The rainfall from the coastal plains to the Western slopes of Western Ghats, the dry deciduous forests and the plains' areas varies considerably, and so does the distribution of vegetation. The distribution of wildlife can be observed and correlated with the existing ecological factors.

On the basis of terrain, precipitations and climate, the very distribution of vegetation can be predicted. What is being seen today can prove to be one of the best examples of the effects of

Insects belong to ARTHROPODA, a group of creatures whose bodies consist of jointed legs. Among their numbers being spiders and Scorpion, centepedes and millipedes, lobster and crab. Insects are distinguished from all of these by having six legs, and the body is divided into three distinct parts, the head, thorax (middle part), and abdomen (tail part). Spiders and scorpions have eight legs and the body is divided into 2 parts; centepedes and millipedes have numerous legs and many segments, and there can be no confusion about lobster's and crabs.

Insects have a distinct pair of highly sensitive feelers (antennae) on their head with which it not only feels its way about, but also smells, receives and transmits wireless messages and does many other inconvincibly wonderful things. Did you know, that a butterfly can detect sugar when a spoonful is diluted in 75 buckets of water? Or that it can smell a fraction of one thousandth of a milligram of attractive odour released by a female ten kilometers away. The head also bears a pair of most complex organs of vision, the compound eye, which is often made up of over 20,000 separate eyes. In most insects the thorax bears one or two pairs of wings. The insects were indeed the first animals on the earth which really flew, millions of years before even the birds did.

A marvel of the anatomy of the insect is that its body is enclosed in a case of hollow armour plates that combines in itself the advantages of lightness, compactness, rigidity, flexibility, mechanical strength and resistance to numerous corrosive and harmful chemicals. The armour plates constitutes its skeleton which lies superficially on the body and not heavy and bony like ours. It is made up of a chemical substance called chitin.

In the respiratory system of insects there is no lungs, no haemoglobin in insect blood, which is the oxygen carrier in our blood. The air is carried directly to the interior of the very cell that needs it by a system of delicate branching tubes called 'tracheae'. This accounts for the astonishing powers of endurance and muscular strength of insects. To illustrate this - "A Staghorn beetle can drag a load that is 90 tonnes heavier than itself over a distance 30 times its own length for almost half an hour without getting tired. The common flea, with legs hardly a millimetre long, can jump a horizontal distance of about 32 cm and a height of 20 cm. If man (say 180 cm tall) were to compete with the flea in a jumping competition, he would have to do a long jump of a quarter of a kilometre and a high jump of 137 metres."

The insects vary in sizes. The smallest insect is smaller than large amoeba and measures 0.25mm long and the largest insect, a fossil dragonfly was 75cm long. The colours of insects are as varied as their sizes. Some are dull and some are coloured while others are brilliant white, red, yellow, orange, brown, green, blue, violet or black. Many are iridescent and coloured metallic green, blue, violet or black. They have beautiful marks, spots, 'eyes' with beautiful patterns. Some beetles, butterflies and moths are of great beauty. The wide range of colours is either due to multiple reflections, selective absorption, refraction, diffraction and scattering or interference of light waves by the peculiarities in the minute structure of the body integument. The common pigments of insects are derived from the food of the young and are generally derivatives of chlorophyll of the leaves, carotinoid pigments, melanin etc. The white colour of many insects is often due to deposits of urate crystals. The colours of butterflies and moths and many of our iridescent beetles are not due to the presence of a colouring matter or pigment but are the result of light waves. The group or Class of insects divided into a number of lesser groups or orders such as which contain beetles, bugs, fleas, dragonflies, cockroaches, flies, bees, grasshoppers and scale winged insects (lepidoptera).

Some benefits of Insects :

Research into the genetics of the African swallow tail helped to make the recent advance in combating Rhesus (Rh) disease, one of the major causes of infant mortality, by suggesting how this disease is transmitted to unborn children. Other butterflies are useful in the study of cancer, anaemia and many viral infections. It is true that caterpillars of some species prove to be devastating pests on specific crops. But, equally, others control weed plants by devouring them. Also, current studies on butterflies that retains alkaloids in them may yield powerful but ecologically harmless pesticides. In any case, cross pollination and silk are but two of the many boons bestowed upon human kind by these exquisite creations of nature.

A word of caution to the butterfly enthusiast, Zealour collectors have caused extinction of more than one species. The current fashion of using colourful butterfly wings for decorating walls, trays and other items is also causing world wide concern. So collecting butterflies should be avoided except for Scientific purposes.

The Indian subcontinent can boast of some 1,400 species (2000 including all forms or subspecies) out of a world tally of 20,000. Destruction of habitat, indiscriminate use of pesticides and other factors have made 360 of these forms rare and over 140 forms are exceedingly rare in our country. Butterfly conservation is essential for human welfare for these fragile creatures are an important indicator of the health of natural environment.